

REMARKS/ ARGUMENTS

Claims 17-20, 23-34 and new claims 35 and 36 are pending in the application.

Reconsideration and withdrawal of all outstanding rejections are hereby respectfully requested in view of the above amendments and the following remarks.

Applicant acknowledges that the terminal disclaimer filed on December 23, 2008 has been reviewed and accepted by the United States Patent and Trademark Office.

Claims 17-20 and 23-36 stand rejected under 35 USC 103(a) as being unpatentable over Heydecke et al. ("Heydecke") WO 00/23637 in view of US Patent 6,294,066 ("Mani"). This rejection is respectfully but strenuously traversed and reconsideration and a withdrawal of the rejection is respectfully requested.

The Examiner contends that Heydecke discloses the Applicant's claimed electrodialysis device and method for the treatment of an electroless deposition bath comprising electrodialysis arrangements each having diluate compartments for holding the metal plating bath at those concentrate compartments that are separated from the diluate compartments through ion exchange membranes. The Office Action further contends that the concentrate compartments are intended to hold a concentrate fluid serving to adsorb interfering substances that are to be removed from the metal plating bath as well as anodes and cathodes. The Office Action considers Heydecke to disclose electrodialysis arrangements that include a first electrodialysis arrangement having alternating concentrate compartments and diluate compartments as well as cathodes and anodes and further contends that the diluate compartments are separated on the cathode side thereof from the neighboring concentrate compartment by a mono-selective cation exchange membrane and on the anode side thereof from a neighboring concentrate compartment

by an anion exchange membrane. The Office Action further considers Heydecke to disclose a second electro dialysis arrangement having alternating diluate compartments and concentrate compartments as well as cathodes and anodes, the concentrate compartments being each separated on the cathode side thereof from a neighboring diluate compartment by anionic exchange membrane and on the anode side thereof by a neighboring diluate compartment by a mono-selective anionic exchange membrane so that the metal plating bath may be conducted simultaneously to all the diluate compartments in the two electro dialysis arrangements.

The Office Action considers Heydecke to disclose a method for regenerating an electroless metal plating bath and rejects the method claims for reasons similar to the rejection set forth in connection with the apparatus claims.

The Office Action acknowledges and admits that the Heydecke patent does not disclose the use of the ion exchange resin in conjunction with the concentrate with the tanks and circuits as claimed by the Applicant. The Office Action therefore cites the Mani reference to support a disclosure of conventional use of tanks and flow circuits (citing to Mani figures 5-13 and col. 12, lines 1-50). The Office Action rejection considers it to be obvious to a person of ordinary skill in the art at the time the invention was made to modify Heydecke by what is taught in Mani. The claimed motivation set forth in the Office Action is alleged to be because the Mani patent is - considered to teach conventional use of tanks and circuits to allow further purification of solutions obtained by electro dialysis in an ion exchange column, and is also considered to teach allowing the maintaining of multivalent metal cation concentrations at a level low enough to obtain long term trouble free operation of the electro dialysis process (citing to col. 12, lines 40-43 or Mani).

Applicant's invention is not taught, suggested or disclosed by the cited references. In summary, the Examiner basically contends that it would have been obvious to modify Heydecke et al. with Mani because of Mani's teaching of conventional use of tanks and circuits to allow further purification of solutions obtained by electrodialysis in an ion exchange column, and that this would also allow the maintaining of a multivalent cation concentration at a level low enough to obtain long term trouble-free operation of the electrodialysis process.

First, Applicant has amended the independent claims, namely, claim 35 and 36 to more particularly articulate the present invention and distinguish the Applicant's advice and method over the cited references. Second, even if the combination of Heydecke et al. and Mani is made as proposed in the Office Action the Applicant's presently claimed invention is still not arrived at. Applicant has amended the claims to include the feature that the volume streams of fluid flowing between the electrodialysis arrangements and the collecting tanks on the one side and between the collecting tanks and the main cationic exchanger on the other side are adjusted independently of each other. This feature is not disclosed by either of the cited references. Neither Heydecke et al. nor Mani discloses that the fluid is allowed to circulate in the first circuit between the concentration compartments and the collecting tank and in a second circuit between the collecting tank and the main cationic exchanger. Applicant's present invention now recites this feature in the amended claims:

wherein the volume streams of fluid to be circulated between the electrodialysis arrangements and the collecting tanks on the one side and between the collecting tanks in the main cation exchangers on the other side are adjusted independently of each other.

Heydecke et al. does not disclose the presently claimed flow circuit external of the electrodialysis arrangements. Although Mani does disclose a flow circuit, the embodiment shown in Mani differs from the Applicant's claimed invention by simply circulating the fluid in a

base loop which leads from the base compartment directly to the ion exchange column and then directly back to the input of the same base compartment (see col. 12, lines 2-7 with respect to Fig. 5 in the Mani patent). Therefore, there are not two flow circuits, as claimed by the Applicant, with a collecting tank combining the two flow circuits, but only one (see for example Fig. 7 in the Mani patent: a single flow circuit from Base compartment 192 via Base Tank 202 and pump P2 to ion-exchange column 206 and from there back to Base compartment 192 via cartridge filter 210, flow meter 212 and valve V).

Applicant's claimed invention with the feature of having the first circuit and second circuit, as claimed, distinguishes the present invention over the cited references and further provides an important difference realized with the present invention. According to the Applicant's claimed device and method, special factors are associated with the claimed arrangement of flow circuits. By providing two flow circuits which are connected to each other by the collecting tank it is possible to have fluid be circulated in each one of these two circuits *independently*. As a result, the concentration of metal ions in the concentrate solution may be adjusted very flexibly while having the concentrate solution be conveyed through the concentrate compartments at a rate that is largely independent from the rate required to convey the fluid through the main cation exchanger in order to adjust the metal concentration barrier. Namely, if the metal cation concentration is to be adjusted at a low level, for example, it will --all other parameters being given-- be necessary to increase the rate at which the fluid is conducted through the main cation exchanger, because then, the main cation exchanger is able to efficiently extract the metal cations from the concentrate fluid. However, it may be that the flow rate of the concentrate solution to be conducted through the concentrate compartments of the electrodialysis arrangement shall not be adjusted too high for certain reasons. In order to overcome these

contradictory requirements, the present invention teaches a novel device and method providing two flow circuits, wherein one traverses the concentrate compartments in the electrodialysis arrangements and the other one traverses the main cation exchanger, and wherein these two flow circuits are in contact with each other in the collecting tank. With the Applicant's presently claimed arrangement, it will be possible by simply adjusting the ratio of the flow rates in two flow circuits in order to adjust the metal cation concentration in the concentrate solution. The flow rate through the concentrate compartments may be set independently of this ratio and may thus be set at a lower level than that of the other circuit. These important features of the present invention are believed to patentably define the Applicant's present method and device over the cited art.

In addition, Mani does not teach, nor does it suggest, providing two flow circuits external of the electrodialysis arrangement which connect the electrodialysis arrangement to the cation exchanger by a collecting tank. Nor does Mani teach or suggest providing these two flow circuits in order to have the volume flow through the base compartment of the electrodialysis arrangement be independently adjusted to the volume flow through the cation exchanger. Mani is silent as to such an embodiment and does not teach any problem associated with maintaining a low flow rate of the solution through the base compartment. Therefore, those skilled in the art even if considering Mani, would not have provided for the special arrangement of flow circuits as claimed in Applicant's device and method. For these reasons, the present invention, as recited in the claims, is not obvious nor is it disclosed by the cited references. Accordingly, for reasons set forth above, Applicant respectfully requests reconsideration and allowance of the pending claims.

Amendment in response to the office action dated March 13, 2009

Response Dated: June 9, 2009

If an extension of time or a further extension of time is required, the Commissioner is hereby authorized to consider this a request for an appropriate extension of time.

Respectfully submitted,
HARDING, EARLEY, FOLLMER & FRAILEY
Attorneys for Applicant



Frank J. Bonini, Jr., Registration No. 35,452
86 The Commons at Valley Forge East
1288 Valley Forge Road
P. O. Box 750
Valley Forge, PA 19482-0750
Telephone: 610-935-2300
Fax: 610-935-0600

Date: 6/9/09